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SOVIET AVIATION MEDICINE

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In USSR aviation medicine, particular emphasis is placed on prophylaxis. This involves good living conditions, a wholesome diet, adequate rest, and efficient health care for aviation personnel. Of great importance for effective prophylaxis is I. P. Pavlov's teaching on the unity of the organism and environment, and the constant interaction between them taking place through the medium of the grain cortex. Pavlov's teaching on the dynamic stereotype is of especial significance here.

In the life of an individual airman and whole groups of flying personnel, transfers from one detachment to another for the benefit of the service are unavoidable. These transfers are accompanied by changes in climatic, geographic, hygienic, and living conditions which necessitate development of a new stereotype of existence on the part of the airman. The new stereotype is based on readjustment of the system of conditioned reflex connections in such a manner that a certain state of equilibrium is established between the inner processes of the organism and the environment. This readjustment represents adaptation of the organism to changed conditions.

Readjustment of the stereotype of existence and its replacement with a new stereotype occur in all cases of training of students and fliers as well as in changes from one type of aircraft to another. A physician in the aviation service must always remember that the initial development of a stereotype and especially a radical change to a new stereotype frequently involve a great strain on the nervous system. At the same time, a firmly developed dynamic stereotype, for instance a strongly inculcated system of habits in connection with controlling a plane, is of great advantage to the organism because its retention requires an ever-decreasing nervous effort. However, under the circumstances and in accordance with Pavlov's teaching, "the stereotype acquires an inert quality, so that it can be changed only with difficulty and is not

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overcome easily by a new environment and new stimuli." In a new environment, which requires a new stereotype, the elements of the old stereotype, which is no longer needed and may even be harmful, continue to exert an influence for a long time. Thus, the theory of the dynamic stereotype enables one to understand the physiological nature of a phenomenon that has been noticed long ago in practical flying instruction, namely that old habits acquired in controlling an aircraft interfere with the learning of new habits.

One of the most important conditions for rebuilding aviation medicine in the spirit of Pavlov's teaching remains the study of Pavlov's work. If this condition is fulfilled, the horizon of supervisors and army physicians is widened considerably, so that a change of outlook on scientific problems in the field of aviation medicine becomes possible. Simplified schemes and primitive ideas in regard to physiological functions of the organism, particularly the higher nervous activity of human beings, are then discarded.

By studying Pavlov's work, scientific medical workers in the field of aviation have clarified a number of complicated questions; for instance, problems connected with the effect of oxygen starvation on the higher nervous activity of humans and animals, specific conditions of controlling aircraft in blind flying, the role and significance of binocular vision in landing aircraft, various illusory sensations, and other problems of importance in practical aviation.

The approach to the problems under study has changed considerably. A tendency to apply objective methods to the investigation of the functions of the human organism is noticeable everywhere. One may record as an achievement, in the work of the Institute of Aviation Medicine, the Central Scientific Research Hospital, and some laboratories of aviation medicine, the application of the method of conditioned reflexes to investigation of the higher nervous activity of man.

Methods of determining the efficiency of fliers underground conditions and particularly in flight are of special importance to aviation medicine. There can be no doubt that an objective evaluation of a flier's efficiency is possible only on the basis of Pavlov's physiological teaching, i.e., by applying a strictly objective method of investigating higher nervous activity. However, workers in the field of aviation medicine are confronted with the difficult and responsible task of developing specialized clinico-physiological methods for investigating higher nervous activity under the specific conditions encountered in flying.

Another problem which is very important for aviation medicine, namely that of methods for determining types of the human nervous system, also remains unsolved. This problem is of exceptional importance in the selection, instruction, and assignment of persons who have completed the study of aviation, as well as for medical examinations in connection with flying.

As far as a number of problems which are of the greatest significance for aviation medicine are concerned, particularly development of methods for the investigation of higher nervous activity, evaluation of the efficiency of fliers, determination of the type of nervous system, and objective recording of basic functions of the visual and auditory analysors, workers in the field of aviation medicine expect effective aid from institutes and laboratories of the Academy of Sciences USSR, and the Academy of Medical Sciences USSR.

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